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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/042,666 03/17/98 GALVANAUSKAS

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MM92/0710

EXAMINER

LEE, J

ART UNIT

PAPER NUMBER


2874

DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/042,666	Applicant(s) Almantas Galvanauskas et al.	
	Examiner John D. Lee	Group Art Unit 2874	

☒ Responsive to communication(s) filed on May 26, 2000 (Request for CPA)

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire THREE (3) month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-28 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☒ Claim(s) 14-28 is/are allowed.
- ☒ Claim(s) 1-13 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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The request filed on May 26, 2000, for a Continued Prosecution Application (CPA) under 37 CFR § 1.53(d) based on parent Application No. 09/042,666 is acceptable and a CPA has been established. The amendment filed on March 21, 2000, has now been entered. An action on the CPA follows.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action in parent Application No. 09/042,666.

Claims 1-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,815,307 to Arbore et al. Arbore et al discloses an ultrashort pulse generator comprising an ultrashort optical pulse source and a wavelength conversion apparatus 10 for adjusting the chirp of the ultrashort optical pulse and converting the wavelength thereof (for example, to a second harmonic wavelength of the ultrashort optical pulse wavelength). The conversion apparatus 10 is a grating based device. Although not stated in the reference, such devices are well known in the art to include optical fiber gratings, so that the apparatus 10 could obviously be fabricated in an optical waveguide. The apparatus 10 of Arbore et al is also clearly an optical parametric device, operating on optical nonlinear principles to convert the wavelength of the ultrashort optical pulse therein. The second harmonic generation portion of the Arbore et al wavelength conversion apparatus constitutes a "mode converter" (as recited in applicant's claims 2 and 4). The use of adiabatically tapered input waveguides for ease of light insertion into other optical waveguides is well known in the art. The use of such an adiabatically tapered input waveguide in Arbore et al would thus have been obvious to the person of ordinary skill in the art. Note that the nonlinear material for wavelength conversion

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apparatus 10 can be a periodically-poled ferroelectric material such as KTP and isomorphs of KTP (column 6, lines 44-60, of Arbore et al). The specific ultrashort optical pulse source used in the reference is not identified, but the general discussion (see the paragraph bridging columns 6 and 7) indicates that a known ultrafast laser should be employed. This obviously implies that lasers such as those identified in applicant's claims 8-10 should be used, and the use of any of them would thus have been obvious to the person of ordinary skill.

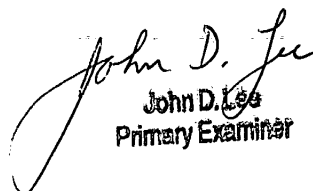
Claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,815,307 to Arbore et al as applied to claim 1 above, and further in view of U.S. Patent 5,321,707 to Huber. The only difference between the Arbore et al device and that of applicant's claim 12 is that there is no amplifier upstream of the wavelength conversion apparatus 10 for amplifying the ultrashort pulses prior to conversion to a different (e.g. a harmonic) wavelength. The use of upstream and downstream amplifiers, such as rare earth doped optical fiber amplifiers, however, has been known in the art for a long time. Note, for example, the Huber reference, which shows a rare earth doped optical fiber amplifier 64 downstream of the active elements in a pumped active optical device. The person of ordinary skill in the art would have recognized that any optical signal that has been newly generated or converted will experience a loss in intensity as it travels along, thus necessitating the use of in-line amplifiers like that of Huber. It would thus have been obvious to use an upstream amplifier like the rare earth doped optical fiber amplifier 64 of Huber in the Arbore et al pulse generation device, providing the necessary amplification for the wavelength conversion apparatus 10. Regarding applicant's claim 13, the rare earth doped optical fiber amplifier of Huber includes erbium doped optical fiber amplifiers.

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Claims 14-28 are allowed. The reasons are clearly stated in a previous Office action (paper number 4, mailed August 26, 1999) in parent Application No. 09/042,666.

The arguments set forth in the amendment filed on March 21, 2000, have been fully considered but they are not deemed to be persuasive. Applicant argues in this amendment that the prior art (Arbore et al in particular) does not disclose or suggest that an optical parametric generation element (for ultrashort pulse oscillation) can be formed as an optical waveguide. Applicant states that there is no mention of waveguides anywhere in the Arbore et al reference. The Examiner believes, however, that the discussion in Arbore et al in column 6, lines 44-60, clearly suggests the use of many forms of quasi-phase-matched OPG elements, including waveguides (even though the word "waveguide" does not appear in this passage), particularly since the types of structures discussed therein are known in the art to be formed as waveguides (see U.S. Patent 5,615,041 to Field et al). Applicant further challenges the Examiner's statement that frequency conversion elements such as second harmonic generators are well known in the art to include optical fiber gratings. In response to applicant's request for substantiation of this statement, please refer to U.S. Patent 5,013,115 to Kashyap which clearly illustrates an optical fiber grating second harmonic generator.

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956 or to the technical support staff supervisor at telephone number (703) 308-4854.


John D. Lee
Primary Examiner